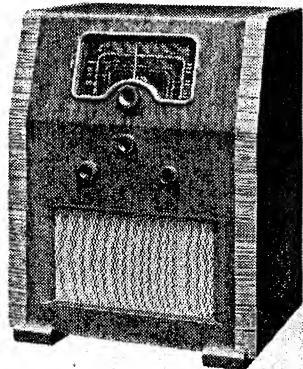


"TRADER" SERVICE SHEET

368



The Alba 820.

SHORT-WAVE ranges of 12.5-32 m (referred to below as SW1) and 28-85 m are covered by the Alba 820 4-valve (plus rectifier) AC 4-band superhet.

Identical chassis are fitted in the 620 armchair console and the 670 console, while the chassis of the 725 radio-gramophone is very similar, the differences being explained under "725 Modifications."

It should be noted that there are AC/DC models bearing the same model numbers but this *Service Sheet* covers only

ALBA 820, 620, 670 AND 725 (AC)

the AC models and was prepared on an 820 table receiver.

Release date for 620, 670 and 820 (AC) : March, 1938.

Release date for 725 (AC) : July, 1938.

CIRCUIT DESCRIPTION

Aerial input on MW and LW is via SW coupling coils L9, L10 and MW and LW coupling coils L1, L2 to inductively-coupled band-pass filter. Primary coils L3, L4 are tuned by C20; secondaries L13, L14 by C23; coupling by coils L5, L6, L7, L8. On SW, input is via coupling coils L9 (SW1) and L10 (SW2) to single tuned circuits L11, C23 (SW1) and L12, C23 (SW2).

First valve (V1, **Mullard metallised TH4**) is a triode hexode operating as frequency changer with internal coupling. Triode oscillator grid coils L15 (SW1), L16 (SW2), L17 (MW) and L18 (LW) are tuned by C24; parallel trimming by C26 (SW2), C27 (MW) and C28 (LW); series tracking by C5 (MW) and C25 (LW). Reaction by coils L19 (SW1), L20 (SW2), L21 (MW) and L22 (LW).

Second valve (V2, **Mullard metallised VP4B**) is a variable-mu RF pentode operating as intermediate frequency amplifier with tuned-primary tuned-secondary iron cored transformer couplings C29, L23, L24, C30 and C31, L25, L26, C32.

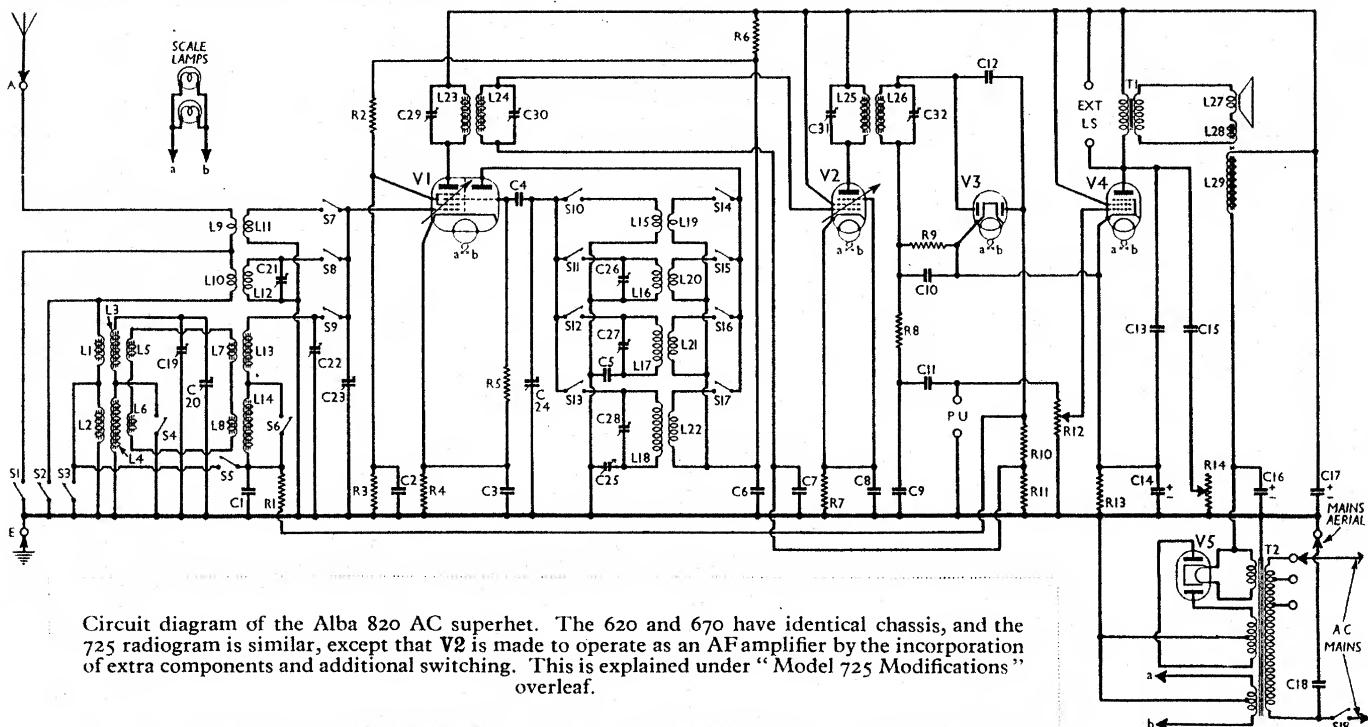
Intermediate frequency 117.5 KC/S.

Diode second detector is part of separate

double diode (V3, **Mullard metallised 2D4A**). Audio frequency component in rectified output is developed across load resistance R9 and passed via IF stopper R8, AF coupling condenser C11 and manual volume control R12 to CG of pentode output valve (V4, **Mullard Pen A4**). IF filtering by C10, R8 and C9. Provision for connection of gramophone pick-up across R12. Fixed tone correction by C13, and variable tone control by C15, R14, both in anode circuit. Provision for connection of high impedance external speaker by terminals across primary of internal speaker input transformer T1.

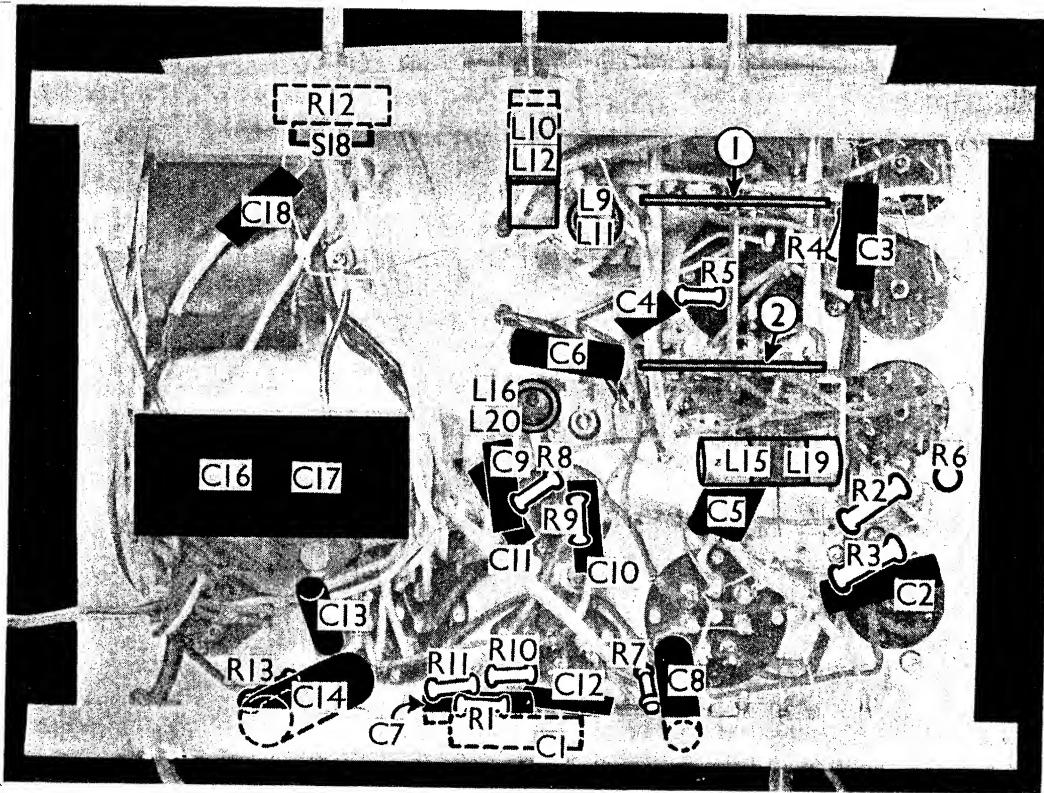
Second diode of V3, fed from L26 via C12, provides DC potentials which are developed across load resistances R10, R11 and fed back through decoupling circuits as GB to FC (except on the two SW bands) and IF valves, giving automatic volume control. Delay voltage is obtained from drop along R13 in V4 cathode circuit.

HT current is supplied by IHC full-wave rectifying valve (V5, **Mullard IW4/350**). Smoothing by speaker field L29 and dry electrolytic condensers C16, C17. The mains aerial plug, when inserted in the aerial socket, couples one side of the mains to the aerial via C18. When it is not being used as such the plug is inserted in an extra earth socket, so that C18 becomes a mains RF by-pass condenser.



Circuit diagram of the Alba 820 AC superhet. The 620 and 670 have identical chassis, and the 725 radiogram is similar, except that V2 is made to operate as an AF amplifier by the incorporation of extra components and additional switching. This is explained under "Model 725 Modifications" overleaf.

Under - chassis view. Diagrams of the two switch units are overleaf. The tone control components **R14**, **C15** are wired to the speaker input panel inside the cabinet, and are therefore not shown in this or the plan chassis view.



COMPONENTS AND VALUES

RESISTANCES			Values (ohms)
R1	V1 hexode CG decoupling	..	1,000,000
R2	V1 SG HT feed potential	..	10,000
R3	divider resistances ..	..	25,000
R4	V1 fixed GB resistance ..	..	200
R5	V1 osc. CG resistance ..	..	25,000
R6	V1 SG and osc. anode HT feed	..	1,000,000
R7	V2 fixed GB resistance ..	..	150
R8	IF stopper ..	..	59,000
R9	V3 signal diode load ..	..	500,000
R10	V3 AVC diode load resistances ..	..	500,000
R11	V3 AVC diode load resistances ..	..	300,000
R12	Manual volume control ..	..	500,000
R13	V4 GB and AVC delay ..	..	150
R14	Variable tone control ..	..	50,000

CONDENSERS (Continued)		Values (μ F)
C ₂₈ †	Osc. circuit LW trimmer	0.00003
C ₂₉ †	rst IF trans. pri. tuning	—
C ₃₀ †	1st IF trans. sec. tuning	—
C ₃₁ †	2nd IF trans. pri. tuning	—
C ₃₂ †	2nd IF trans. sec. tuning	—

* Electrolytic. † Variable. ‡ Pre-set.

OTHER COMPONENTS				Approx. Values (ohms)
L ₁	Aerial MW and LW coupling coils	...	...	60·0
L ₂		...	...	10·0
L ₃	Band-pass primary coils	...	...	1·6
L ₄		...	...	18·5
L ₅	Band-pass coupling coils, total	...	...	47·0
L ₇	Band-pass coupling coils, total	...	...	45·0
L ₉	Aerial SW ₁ coupling coil	...	...	0·1
L ₁₀	Aerial SW ₂ coupling coil	...	...	0·2
L ₁₁	Aerial SW ₁ tuning coil	...	...	Very low
L ₁₂	Aerial SW ₂ tuning coil	...	...	0·1
L ₁₃	Band-pass secondary coils	...	...	1·6
L ₁₄		...	...	21·0
L ₁₅	Osc. circuit SW ₁ tuning coil	...	...	0·05
L ₁₆	Osc. circuit SW ₂ tuning coil	...	...	0·1
L ₁₇	Osc. circuit MW tuning coil	...	...	2·5
L ₁₈	Osc. circuit LW tuning coil	...	...	13·0
L ₁₉	Oscillator SW ₁ reaction	...	...	17·0
L ₂₀	Oscillator SW ₂ reaction	...	...	0·4
L ₂₁	Oscillator MW reaction	...	...	44·0
L ₂₂	Oscillator LW reaction	...	...	67·0
L ₂₃	1st IF trans.	{	Pri.	33·0
L ₂₄		{	Sec.	33·0
L ₂₅	2nd IF trans.	{	Pri.	33·0
L ₂₆		{	Sec.	33·0
L ₂₇	Speaker speech coil	...	...	1·9
L ₂₈	Humi neutralising coil	...	...	0·1
L ₂₉	Speaker field coil	...	...	1,200·0
T ₁	Speaker input trans.	{	Pri.	450·0
		{	Sec.	0·4
T ₂	Mains trans.	{	Pri., total	24·0
		{	Heater sec.	0·05
		{	Rect. heat. sec.	0·1
		{	HT sec., total	470·0
S ₁ -17	Waveband switches	...	...	—
S ₁₈	Mains switch, gauged R ₁₂	...	...	—

DISMANTLING THE SET

Removing Chassis.—Remove the two lowest knobs and the tuning knob (recessed screws) and the four bolts (with washers and rubber washers) holding the chassis to the shelf. The chassis can now be withdrawn from the cabinet to the extent of the speaker leads, which is sufficient for normal purposes.

If it is desired to free the chassis entirely, unsolder the speaker leads and when replacing, connect them as follows, noting that the tags are numbered:— F and 3 joined, red; 1, black and one side of **C15**; F, blue. The white lead and the yellow lead from the tone control go to the earthing tag on the speaker frame.

Removing Speaker.—The speaker can be removed from the cabinet by unsoldering the leads and removing the nuts, washers and rubber washers from the four screws holding it to the sub-baffle.

When replacing, see that there is a rubber washer on each of the fixing screws, between the sub-baffle and the speaker. place the transformer on the right and connect the leads as above.

VALVE ANALYSIS

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 TH4	250 Oscillator	2.4 5.0	52	3.9
V2 VP4B	250	8.0	250	3.1
V3 2D4A	—	—	—	—
V4 PenA4	236	38.0	250	6.6
V5 IW4/350	310†	—	—	—

† Each anode, AC.

Valve voltages and currents given in the table above are those measured in our receiver when it was operating on mains

of 225 V, using the 220 V tapping on the mains transformer. The receiver was tuned to the lowest wavelength on the medium band and the volume control was at maximum, but there was no signal input.

Voltages were measured on the 400 V scale of a model 7 Universal Avometer, chassis being negative.

GENERAL NOTES

Switches.—S1-S17 are the waveband switches, ganged in two rotary units beneath the chassis. These are indicated in our under-chassis view and are shown in detail in the diagrams in column 3, where they are drawn as seen from the front of the underside of the chassis. The table (column 2) gives the switch positions for the four control settings, starting from fully anti-clockwise. A dash indicates *open* and C, *closed*.

S18 is the QMB mains switch, ganged with the volume control R12.

Coils.—L1-L6; L7, L8, L13, L14; L17, L18, L21, L22; and the IF transformers L23, L24 and L25, L26 are in five screened units on the chassis deck, the last two containing their trimmers.

L9, L11; L10, L12; L15, L19 and L16, L20 are in four unscreened tubular units beneath the chassis.

External Speaker.—Two terminals are provided on the internal speaker transformer panel for a high impedance (about 8,000 Ω) external speaker.

Scale Lamps.—These are two Osram MES types, rated at 6.2 V, 0.3 A.

Condensers C16, C17.—These are two $0.6 \mu\text{F}$ dry electrolytics in a single carton beneath the chassis, having a common negative (black) lead. The red lead is the positive of C16 and the yellow the positive of C17.

Chassis Divergencies.—Our chassis differs in several respects from the makers' original diagram. This shows R5 returned

TABLE AND DIAGRAMS OF THE SWITCH UNITS

Switch	SW1	SW2	MW	LW
S1	C			
S2		C		
S3			C	
S4	C		C	
S5	C			C
S6			C	
S7	C			
S8		C		
S9			C	C
S10	C			
S11		C		
S12			C	
S13				C
S14				
S15		C		
S16			C	
S17				C

to chassis and no tone control circuit. The tone control components C15, R14 are wired inside the cabinet to the speaker terminal strip and are therefore not shown in our chassis illustrations.

The values of the coil resistances in our chassis differ from those given by the makers, so that any discrepancies here may not indicate a fault, but merely that slightly different coils are in use.

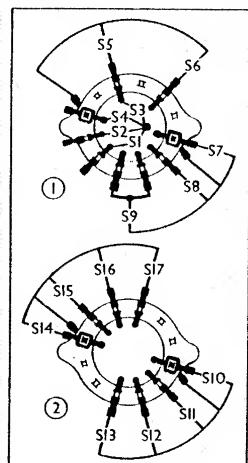
The same applies to the resistances of the mains transformer windings.

MODEL 725 MODIFICATIONS

In the radiogram model 725 V2 is switched to provide AF amplification for the pick-up. The modifications are as follows.

One pick-up socket goes to chassis, while the other goes to a fixed contact on an extra switch bank. The bottom of L24 is disconnected from the AVC line and taken to the moving contact of the switch. The AVC line goes to four other fixed contacts of this switch. In the SW1, SW2, MW and LW positions, L24 is connected to the AVC line, while in the gram position it is connected to the upper pick-up socket. The pick-up is thus fed into the grid circuit of V2.

Diagrams of the switch units, as seen from the front of the underside of the chassis.



In the anode circuit of V2, between the top of L25 and the HT line a 5,000 Ω load resistance is inserted. The junction of L25 and this resistance goes to one side of a $0.002 \mu\text{F}$ by-pass condenser, the other side of which goes to chassis. The junction of L25 and the load resistance also goes to a $0.005 \mu\text{F}$ AF coupling condenser, the other side of which goes to one fixed contact of another rotary switch.

The junction of C11 and R12 is broken, and R12 is taken to the moving contact of this second rotary switch. C11 is taken to four fixed contacts of this switch. On SW1, SW2, MW and LW, C11 is thus connected to R12 as in our diagram, while on gram the AF coupling condenser goes to R12, C11 being disconnected, and so muting radio.

CIRCUIT ALIGNMENT

IF Stages.—Connect signal generator between control grid (top cap) of V1 and chassis, and feed in a 317.5 KC/S signal, with the receiver switched to MW. Now adjust C22, C31, C30 and C29 in turn for maximum output, reducing the input progressively as the circuits come into alignment. Re-check these settings.

RF and Oscillator Stages.—See that the scale pointer is horizontal when the gang is at maximum. If it is not, adjust it by means of the pointer clip on the drive spindle. The volume control should be set at maximum, and the signal generator connected to the A and E sockets.

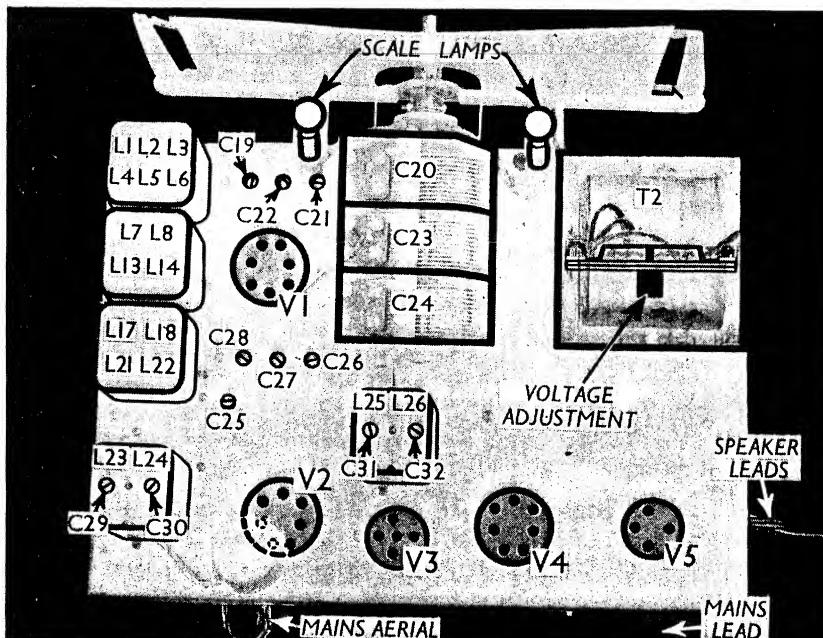
MW.—Switch set to MW, tune to 250 m on scale, feed in a 250 m (1,200 KC/S) signal, and adjust C27, then C22 and C19, for maximum output.

LW.—Switch set to LW, tune to 1,200 m on scale, feed in a 1,200 m (250 KC/S) signal, and adjust C28 for maximum output, rocking the gang for optimum results.

Feed in a 1,900 m (157 KC/S) signal, tune it in, and adjust C25 for maximum output, while rocking the gang.

SW2.—Switch set to SW2 (28.85 m), tune to 31 m on scale and feed in a 31 m (9.67 MC/S) signal. Adjust C26 for maximum output, choosing the peak obtained with C26 nearest its minimum position. Now adjust C21 for maximum output.

SW1.—No alignment adjustments are possible on this band.



Plan view of the chassis. Note the six trimmers and the tracker which are adjustable through holes in the chassis deck.